

IN THE CLAIMS:

This listing of claims will replace all prior versions and listing of claims in the application:

Claims 1-4 (Canceled).

Claim 5 (New): An information data recording apparatus for recording information data on a recording medium having a recording track on which the information data is to be recorded and prerecorded data which are preformed on a portion different from the information recording track at first periodic interval, said apparatus comprising:

a memory which temporarily stores the information data to be recorded on the recording medium and supplies the information data in synchronism with a clock signal;

a prerecorded data signal reproducing circuit which detects the prerecorded data from the recording medium and generates a prerecorded data signal;

a clock signal generating circuit which generates the clock signal based on the prerecorded data signal;

a recording device which records the information data supplied from the memory on the recording track of the recording medium; and

a phase comparator which generates a phase difference signal relative to the prerecorded data signal by a phase comparison with a reference signal that has an interval shorter than an interval of a synchronization signal included in the prerecorded data signal, wherein said clock

signal generating circuit generates said clock signal using the phase difference signal generated by said phase comparator.

Claim 6 (New): The information data recording apparatus as claimed in claim 5, further comprising a reference signal generator which generates the reference signal,
wherein the memory stores the information data in synchronism with the reference signal,

Claim 7 (New): The information data recording apparatus as claimed in claim 5, wherein the clock signal is phase-locked with a jitter component contained in the prerecorded data signal,

Claim 8 (New): The information data recording apparatus as claimed in claim 7, wherein the clock signal generating circuit is a phase-locked loop circuit comprising:

a voltage controlled oscillator which generates the clock signal in accordance with a control voltage;

a phase comparator which compares the prerecorded data signal with the clock signal and produces a phase comparison output signal; and

an equalizing circuit which adjusts the phase comparison output signal of the phase comparator to produce the control voltage supplied to the voltage controlled oscillator,

Claim 9 (New): The information data recording apparatus as claimed in claim 5, further comprising a feed-forward circuit which eliminates a phase error in the information data supplied

from the memory, the phase error corresponding to a residual phase error component of the clock signal generated by the clock signal generating circuit.

Claim 10 (New): The information data recording apparatus as claimed in claim 9,
wherein the feed-forward circuit comprises:

a voltage controlled oscillator which generates a second clock signal in accordance with a phase comparison output signal of said phase comparator, and

a second memory for storing said information data supplied from said memory in accordance with said clock signal and supplying said information data to said recording device in accordance with said second clock signal.

Claim 11 (New): The information data recording apparatus as claimed in claim 6,
wherein the reference signal is a periodic signal of a unit length which corresponds to a bit interval that is specified by a recording format used for recording the information data.

Claim 12 (New): The information data recording apparatus as claimed in claim 5,
wherein the first periodic interval corresponds to m , m being an integer, times of a unit period that is specified by a recording format used for recording the information data.

Claim 13 (New): The information data recording apparatus as claimed in claim 12,
wherein the recording medium has other prerecorded data which are preformed at second interval which corresponds to k , k being an integer smaller than m , times of the unit period.

Claim 14 (New): The information data recording apparatus as claimed in claim 12, wherein the unit period corresponds to a plurality of a unit length which corresponds to a bit interval that is specified by a recording format used for recording the information data.

Claim 15 (New): An information data recording apparatus for recording information data on a recording medium having a recording track on which the information data is to be recorded and prerecorded data which are preformed on a portion different from the information recording track, the prerecorded data including first prerecorded data preformed at a first periodic interval which corresponds to m , m being an integer, times of a unit period that is specified by a recording format used for recording the information data, and second prerecorded data preformed at a second interval which corresponds to k , k being an integer smaller than m , times of the unit period, said apparatus comprising:

a memory which temporarily stores the information data to be recorded on the recording medium and supplies the information data in synchronism with a clock signal;

a prerecorded data signal reproducing circuit which detects the prerecorded data from the recording medium and generates a prerecorded data signal;

a clock signal generating circuit which generates the clock signal based on the prerecorded data signal;

a recording device which records the information data supplied from the memory on the recording track of the recording medium; and

a phase comparator which generates a phase difference signal relative to the prerecorded data signal by a phase comparison with a reference signal that has an interval shorter than an interval of a synchronization signal included in the prerecorded data signal, wherein said clock signal generating circuit generates said clock signal using the phase difference signal generated by said phase comparator.

Claim 16 (New): The information data recording apparatus as claimed in claim 15, further comprising a reference signal generator which generates the reference signal, wherein the memory stores the information data in synchronism with the reference signal.

Claim 17 (New): The information data recording apparatus as claimed in claim 15, wherein the clock signal is phase-locked with a jitter component contained in the prerecorded data signal.

Claim 18 (New): The information data recording apparatus as claimed in claim 17, wherein the clock signal generating circuit is a phase-locked loop circuit comprising:

a voltage controlled oscillator which generates the clock signal in accordance with a control voltage;

a phase comparator which compares the prerecorded data signal with the clock signal and produces a phase comparison output signal; and

an equalizing circuit which adjusts the phase comparison output signal of the phase comparator to produce the control voltage supplied to the voltage controlled oscillator.

Claim 19 (New): The information data recording apparatus as claimed in claim 15, further comprising a feed-forward circuit which eliminates a phase error in the information data supplied from the memory, the phase error corresponding to a residual phase error component of the clock signal generated by the clock signal generating circuit.

Claim 20 (New): The information data recording apparatus as claimed in claim 19, wherein the feed-forward circuit comprises:

a voltage controlled oscillator which generates a second clock signal in accordance with a phase comparison output signal of said phase comparator, and

a second memory for storing said information data supplied from said memory in accordance with said clock signal and supplying said information data to said recording device in accordance with said second clock signal.

Claim 21 (New): The information data recording apparatus as claimed in claim 15, wherein the reference signal is a periodic signal of a unit length which corresponds to a bit interval that is specified by a recording format used for recording the information data.

Claim 22 (New): The information data recording apparatus as claimed in claim 21, wherein the unit period corresponds to a plurality of the unit length.

Claim 23 (New): A method for recording information data on a recording medium having a recording track on which the information data is to be recorded and prerecorded data which are preformed on a portion different from the information recording track at first periodic interval, said method comprising the steps of:

temporarily storing the information data to be recorded on the recording medium and supplying the information data in synchronism with a clock signal;

detecting the prerecorded data from the recording medium and generating a prerecorded data signal;

generating the clock signal based on the prerecorded data signal;

recording the information data on the recording track of the recording medium; and

generating a phase difference signal relative to the prerecorded data signal by a phase comparison with a reference signal that has an interval shorter than an interval of a synchronization signal included in the prerecorded data signal, wherein said clock signal is generated using said phase difference signal.

Claim 24 (New): The method as claimed in claim 23, further comprising a step of generating the reference signal,

wherein at the storing step the information data is stored in synchronism with the reference signal.

Claim 25 (New): The method as claimed in claim 23, wherein the clock signal is phase-locked with a jitter component contained in the prerecorded data signal.

Claim 26 (New): The method as claimed in claim 25, wherein the clock signal generating step comprises:

generating the clock signal in accordance with a control voltage;

comparing the prerecorded data signal with the clock signal and producing a phase comparison output signal; and

adjusting the phase comparison output signal to produce the control voltage.

Claim 27 (New): The method as claimed in claim 23, further comprising a step of eliminating a phase error in the information data, the phase error corresponding to a residual phase error component of the clock signal generated at the clock signal generating step.

Claim 28 (New): The method as claimed in claim 27, wherein the eliminating step comprises:

generating a second clock signal in accordance with the phase comparison output signal,
and

secondly storing said information data in accordance with said clock signal and supplying said information data in accordance with said second clock signal.

Claim 29 (New): The method as claimed in claim 24, wherein the reference signal is a periodic signal of a unit length which corresponds to a bit interval that is specified by a recording format used for recording the information data.

Claim 30 (New): The method as claimed in claim 23, wherein the first periodic interval corresponds to m , m being an integer, times of a unit period that is specified by a recording format used for recording the information data.

Claim 31 (New): The method as claimed in claim 30, wherein the recording medium has other prerecorded data which are preformed at second interval which corresponds to k , k being an integer smaller than m , times of the unit period.

Claim 32 (New): The method as claimed in claim 30, wherein the unit period corresponds to a plurality of a unit length which corresponds to a bit interval that is specified by a recording format used for recording the information data.

Claim 33 (New): A method for recording information data on a recording medium having a recording track on which the information data is to be recorded and prerecorded data which are preformed on a portion different from the information recording track, the prerecorded data including first prerecorded data preformed at a first periodic interval which corresponds to m , m being an integer, times of a unit period that is specified by a recording format used for recording the information data, and second prerecorded data preformed at a second interval

which corresponds to k, k being an integer smaller than m, times of the unit period, said method comprising the steps of:

temporarily storing the information data to be recorded on the recording medium and supplying the information data in synchronism with a clock signal;

detecting the prerecorded data from the recording medium and generating a prerecorded data signal;

generating the clock signal based on the prerecorded data signal;

recording the information data supplied from the memory on the recording track of the recording medium; and

generating a phase difference signal relative to the prerecorded data signal by a phase comparison with a reference signal that has an interval shorter than an interval of a synchronization signal included in the prerecorded data signal, wherein said clock signal is generated using said phase difference signal.

Claim 34 (New): The method as claimed in claim 33, further comprising a step of generating the reference signal,

wherein at the storing step the information data is stored in synchronism with the reference signal.

Claim 35 (New): The method as claimed in claim 34, wherein the clock signal is phase-locked with a jitter component contained in the prerecorded data signal.

Claim 36 (New): The method as claimed in claim 35, wherein the clock signal generating step comprises:

generating the clock signal in accordance with a control voltage;
comparing the prerecorded data signal with the clock signal and producing a phase comparison output signal; and
adjusting the phase comparison output signal to produce the control voltage.

Claim 37 (New): The method as claimed in claim 23, further comprising a step of eliminating a phase error in the information data, the phase error corresponding to a residual phase error component of the clock signal generated at the clock signal generating step.

Claim 38 (New): The method as claimed in claim 37, wherein the eliminating step comprises:

generating a second clock signal in accordance with a phase comparison output signal,
and
secondly storing said information data in accordance with said clock signal and supplying said information data in accordance with said second clock signal.

Claim 39 (New): The method as claimed in claim 34, wherein the reference signal is a periodic signal of a unit length which corresponds to a bit interval that is specified by a recording format used for recording the information data.

Claim 40 (New): The method as claimed in claim 39, wherein the unit period corresponds to a plurality of the unit length.